(No Model.)

J. WEBER.

CENTER GRINDER FOR LATHES.

No. 457,389. Patented Aug. 11, 1891.

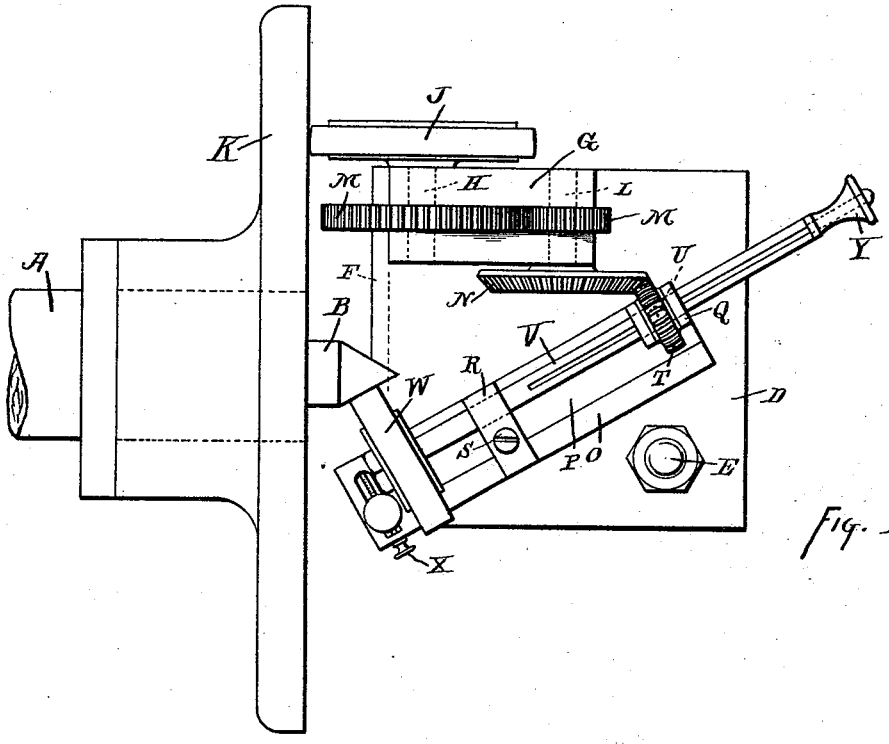

Fig. 1.

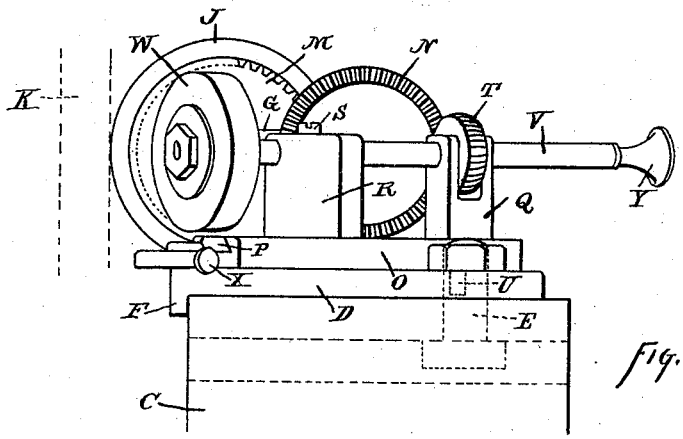

Fig. 2.

John Weber

Witnesses:
P. P. Sheehan
M. S. Belden

Inventor
by James W. See.
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN WEBER, OF HAMILTON, OHIO.

CENTER-GRINDER FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 457,389, dated August 11, 1891.

Application filed March 23, 1891. Serial No. 385,966. (No model.)

To all whom it may concern:

Be it known that I, JOHN WEBER, of Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Center-Grinders for Lathes, of which the following is a specification.

In engine-lathes it is highly important that the live-center should run dead true, and it is also important that the center should be hard. It is found by experience that if the center be perfectly true and be taken out of the spindle and then replaced it will not again be true, and that if the center be turned true and then taken out and hardened and returned to place it will not run true or be round, the hardening having distorted it somewhat. If the center, after being hardened, be ground in a special grinding-lathe, then the center will not run true when put into its own lathe. It therefore becomes essential to accuracy that the center shall be trued while in its own spindle and then left in position. If the center be left soft, so that it may be readily trued as often as needed, then the advantage of a hardened center is lost. If a hard center be employed and it be desired to frequently true it up by grinding in its own lathe, then the fixture for doing this grinding must be of very simple and readily-applied character, else the truing is apt to be neglected. Many center-grinding contrivances have been devised for this purpose; and my present invention relates to improvements in this class of devices, the device being secured to the tool-block of the lathe and the grinding-wheel revolved by being frictionally driven from the face-plate of the lathe or from a special plate put on for the purpose.

My improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a plan of my improved center-grinder shown in connection with part of a lathe-spindle; and Fig. 2 a front elevation of the same, (no lathe-spindle shown,) a portion of the tool-block being shown.

In the drawings, A indicates the usual live-spindle of a lathe; B, the usual live center therein; C, the usual tool-block, mounted on the lathe-saddle and adapted to receive the tool-post; D, a plate arranged to rest upon the top of the tool-block, the tool-post being removed; E, a bolt securing this plate to the tool-block, the lower portion of this bolt engaging the usual T-slot in the tool-block; F, a rib on the lower surface of the plate to come against the end of the tool block and serve in setting the plate square with the tool-block; G, a double bearing formed upon the upper surface of the plate; H, a short shaft journaled in one of these bearings, with its axis at right angles to the lathe-spindle; J, a friction-wheel fast on shaft H, the periphery of this wheel being formed, preferably, of leather or rubber or other elastic or semi-elastic material; L, a second short shaft mounted in the other of the bearings G parallel with shaft H; M, spur-gearing upon shafts H and L and serving to transmit motion from shaft H to shaft L at increased speed; N, a bevel-gear fast on shaft L; O, a plate secured to the upper surface of plate D and carrying the bearings for the wheel-arbor; P, a long dove-tailed slot in plate O to receive and permit of adjustment of one of the bearings of the wheel-arbor, this slot being disposed in a vertical plane about thirty degrees out of parallelism with the vertical plane of the axis of the lathe-spindle; Q, a bearing for the wheel-arbor projecting rigidly upward from the plate O; R, a second bearing for the wheel-arbor mounted to slide in slot P between the face-plate and the bearing Q; S, a set-screw for securing the sliding bearing R in adjusted position in the slot P; T, a bevel-pinion splined to the wheel-arbor and mounted in bearing Q and engaged by bevel-gear N; U, a vertical pivot uniting plate O to plate D and permitting plate O to have a limited angular motion on plate D, this pivot being located vertically below the center of bevel-pinion T; V, the wheel-arbor journaled in bearings Q and R and splined to the bevel-pinion and adapted to slide freely endwise through the bearings and bevel-pinion; W, the grinding-wheel, generally an emery-wheel, secured to the inner end of the wheel-arbor; X, an adjusting-screw for adjusting plate O, angularly upon pivot

U; and Y a swivel-knob upon the outer end of the wheel-arbor to permit of the wheel-arbor being moved endwise by hand while rotating.

Plate D is to be bolted to the tool-block of the lathe, rib F bringing it square. The lathe-carriage is then to be moved toward the head-stock till the friction-wheel engages the face-plate, whereupon the rotating face-plate causes the grinding-wheel to rotate at high velocity. The tool-block is then to be fed inwardly till the periphery of the grinding-wheel is in proper relation to the lathe-center to be ground. The wheel-arbor is then reciprocated by hand to feed the grinding-wheel along the conical surface of the lathe-center, the depth of cut taken by the grinding-wheel being regulated by adjusting the tool-block in and out on the saddle by means of the usual cross feed-screw of the saddle.

Assuming that the axis of the wheel-arbor is at thirty-degrees' angle to the axis of the lathe-spindle, then the lathe-center will have a cone-angle of sixty degrees—an angle adopted as a standard in many first-class shops. If this angle is to be rigidly adhered to, then the angular adjustment of plate O will never be required and need not be provided for; but if it be desired to provide for grinding centers at various angles then the adjustable plate O will be found useful. By means of screw X the wheel-arbor may be adjusted to various angles with the axis of the lathe-spindle. This adjustment of course disturbs the normal relationship of the bevel-gears; but if the bevel-pinion or bevel-gear as an alternative be given a somewhat spherical contour, as shown, the change in angularity of the wheel-arbor will not interfere with the satisfactory working of the gears.

Some lathe-centers project farther from the face-plate than others, and friction-wheel J must engage the face-plate. Consequently plate D has a constant position with reference to the face-plate. A lathe-center projecting quite a distance from the face-plate would thus require that the grinding-wheel be capable of moving quite a distance to the right, and a lathe-center projecting but a short distance would require the grinding-wheel to move quite a way to the left. This long range of wheel movement would call for an undesired projection of the wheel-arbor from bearing R, and it is for this reason that I prefer to make bearing R adjustable along the wheel-arbor, so that it may be set as close to the grinding-wheel as is consistent with the grinding of the given lathe-center. If the center be projected much farther to the right, then bearing R would require to be adjusted farther to the right, and the tool-block would require to be adjusted forwardly to cause the wheel to properly engage the center. The projection of the wheel-arbor to the left of the bearing R may therefore be about the same, regardless of the projection of the lathe-center from the face-plate.

I claim as my invention—

1. In a center-grinder for lathes, the combination, substantially as set forth, of a fixture arranged to be supported by the tool-block of a lathe and provided with bearings at right angles to the lathe-spindle, and also with bearings oblique to the axis of the lathe-spindle, a wheel-arbor provided with a grinding-wheel and arranged to rotate and slide in said oblique bearings, a friction-wheel mounted on a shaft journaled in said first-mentioned bearings, and gearing connecting said friction-wheel with said wheel-arbor.

2. In a center-grinder for lathes, the combination, substantially as set forth, of a fixture arranged to be supported by the tool-block of a lathe and provided with bearings at right angles to the lathe-spindle, a plate mounted upon said fixture and connected thereto by a vertical pivot and provided with bearings, a wheel-arbor provided with a grinding-wheel and arranged to rotate and slide in said last-mentioned bearings, a friction-wheel mounted on a shaft carried in said first-mentioned bearings, and gearing connecting said friction-wheel and wheel-arbor.

3. In a center-grinder for lathes, the combination, substantially as set forth, of a fixture arranged to be supported by the tool-block of a lathe and provided with bearings at right angles to the lathe-spindle, an arbor-bearing supported by said fixture with its axis oblique to the lathe-spindle, a second arbor-bearing in line with the first-mentioned arbor-bearing and arranged to be adjusted to and from the same, a wheel-arbor arranged to rotate and slide in said arbor-bearings, a friction-wheel mounted on a shaft carried in said first-mentioned bearings, and gearing connecting said friction-wheel with said wheel-arbor.

4. In a center-grinder for lathes, the combination, substantially as set forth, of a plate arranged to rest upon the upper surface of and be bolted to the tool-block of a lathe and provided with bearings at right angles to the lathe-spindle, a friction-wheel mounted on a shaft journaled in said bearings and adapted to have its periphery engage a face-plate upon the lathe-spindle, arbor-bearings supported by said plate, a wheel-arbor provided with a grinding-wheel and arranged to rotate and slide in said arbor-bearings, and gearing connecting said friction-wheel with said wheel-arbor.

JOHN WEBER.

Witnesses:
J. W. SEE,
M. S. BELDEN.